



PROGRAM : PODIATRY

SUBJECT : **PATHOLOGY AND MEDICINE**

CODE : **HPMB211**

DATE : SUMMER EXAMINATION – NOVEMBER 2016

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WEIGHT : 50 : 50

TOTAL MARKS : 200

EXAMINER : DR M CAMINSKY

MODERATOR : DR L CHELLA PRONK

NUMBER OF PAGES : 16 PAGES

INSTRUCTIONS : QUESTION PAPERS MUST BE HANDED IN.

REQUIREMENTS : 8-PAGE ANSWER BOOKLETS

INSTRUCTIONS TO CANDIDATES:

PLEASE ANSWER ALL THE QUESTIONS.

TABLES MUST BE COMPLETED ON THE QUESTION PAPER

QUESTION 1

Please complete the following table on various skin conditions on the question paper: [22]

Please be specific when naming and describing conditions and their pathogenesis, lesions, etc.

Marks are given as shown in () in each block (1 x mark per fact)

	Aetiology, morphology and pathogenesis:	Clinical features:
Vitiligo	Due to partial / complete loss of melanocytes – considered to be due to auto-immune destruction of melanocytes, and is often seen with other auto-immune conditions	(2)
Basal cell carcinoma	<p>P53 gene mutation + others Locally invasive → will extend widely and deeply if left untreated! But: Slow-growing & rarely metastasizes</p> <p><u>Complete the following sentence:</u> (2 x ½ = 1)</p> <p>NB!! Any single, ulcerating / nodular lesion in sun-damaged skin should be _____ and _____.</p>	<p>The most common form is nodular ulcerative basal cell carcinoma, which is found mainly on sun-exposed areas. <u>Discuss the appearance of this lesion and its evolution / development over time.</u> (4)</p>
(1)	Can be an allergic / non-allergic response that leads to the complex release of inflammatory mediators – please discuss the inflammatory response and how that causes the characteristic lesions of the condition: (3)	<p>Lasts less than 6 weeks</p> <p>Lesions:</p> <ul style="list-style-type: none"> • Start to appear within 1 hour of exposure • Are called “wheals” or “hives” • Have raised and swollen red / pink area with a paler halo • Range in size from a few mm to several cm diameter • Are associated with itching (sometimes burning) <p>Skin usually returns to normal within 1-24 hours</p>

Psoriasis	<p>Chronic immune mediated aetiology, but it is poorly understood</p> <p>Histology shows marked epidermal thickening and massively increased cell turnover</p> <p>May have a genetic link</p> <p>Up to 20% of patients have associated arthritis</p>	<p>Please list (3 x 1) and briefly explain (3 x 1) the 3 main features of psoriasis: (6)</p> <p>1.</p> <p>2.</p> <p>3.</p>
(1)	<p>Although this is a common skin condition, the aetiology is still poorly understood.</p> <p><u>Please name and briefly discuss the 4 factors that have been implicated in the aetiology of this condition:</u> (4)</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p>	<p>Lesions can be classified as non-inflammatory (open & closed comedones) and / or inflammatory (nodules, papules and cysts) lesions</p> <p>Lesions are found mainly on the face and neck, but also on the back, chest and shoulders</p>

QUESTION 2:

The symptoms of acute leukaemia are directly related to the bone marrow depression. List three symptoms of acute leukaemia, and explain what the underlying cause or mechanism for each symptom is. [6]

QUESTION 3:

A 52-year old woman present with a headache that is associated with pain over her left temple. After careful case taking, common causes of headaches such as tension headaches and migraines are excluded. After various treatments didn't yield any results, she is given a corticosteroid, which relieves the symptoms. A biopsy of the temporal artery shows granulomatous inflammation. [5]

- a. What is your diagnosis? (1)
- b. Please list 4 symptoms / signs of this condition that you will be looking for on physical examination and history taking. Please note that only 1 x mark will be given for general constitutional signs / symptoms. (4)

QUESTION 4:

A 72-year old man with a history of angina pectoris, hyperlipidaemia and hypertension is rushed to hospital with severe crushing chest pain that radiates to his left arm and jaw. He is also sweating, and feels slightly nauseous. He has taken some nitroglycerine, but it had no effect on the chest pain. Once he had been admitted, he has a blood pressure of 94/60 and he develops dyspnoea. [21]

- a. Blood tests show that his CK-MB, TnT and TnI levels are elevated. What do these tests indicate? (1)
- b. A diagnosis of a massive myocardial infarct (MI) is confirmed, and he is sent in for an emergency operation. The MI caused a large transmural infarct in the left ventricle of the patients' heart.
 - i. Briefly explain the process that is taking place in **this patients'** heart and circulatory system that gives rise to the characteristic features of LEFT-sided heart failure (2). Please also list 3 CHARACTERISTIC features of left heart failure (3). (5)
 - ii. After a few months, the patient also starts presenting with features of RIGHT-sided heart failure. Briefly explain the process that is taking place in **this patients'** heart and circulatory system that gives rise to the characteristic features of RIGHT-sided heart failure (2). Please also list 3 CHARACTERISTIC features of right heart failure (3). (5)
- c. Five days after he had the MI, he suddenly develops a sharp, substernal chest pain that radiates to the bottom of the left scapula.
 - i. What complication of a transmural MI did he develop? (1)
 - ii. What other characteristic signs / symptoms would confirm this diagnosis on case taking and physical examination? (3)

- d. Three weeks after leaving the hospital, he presents with decreased strength in his left hand, loss of sensation on the left side of his face, and slightly slurred speech.
- i. Please list 2 differential diagnoses for his presentation. (2)
 - ii. What is the main clinical difference between these two conditions? (1)
 - iii. Based on his recent history of a massive MI in his left ventricle, what is the most likely reason for this complication? Please explain the process that lead to this complication based on the processes that are taking place in his right ventricle and your knowledge of Virchow's triad. (3)

QUESTION 5:

List 4 aetiological factors or clinical situations that may predispose a person to developing a DVT. [4]

QUESTION 6:

A 14-year old boy present with shortness of breath and an audible wheeze. It started while he was playing a soccer game on the fields at his school. He has a history of eczema as a small child, and his father suffers from hay fever. [10]

- a. What is the most like diagnosis for his shortness of breath and wheezing? (1)
- b. Please give a definition of this condition, including 3 characteristic clinical features of this condition. (4)
- c. List three triggers of an intrinsic / non-atopic attack. (3)
- d. What does the term "atopy" mean? (2)

QUESTION 7:

A mother brings her 7-year old child back to you for a follow up consultation. You consulted with the child 7 days ago for influenza. The mother is concerned, as the child is prone to chest infections, and is "just not getting better", and now has a temperature of 38.9°C and no appetite. [7]

- a. What is the most likely cause of acute community acquired pneumonia – i.e. what would you be looking for on history taking? (1)
- b. What signs and symptoms would you be looking out for on history taking and examination to in a child with acute pneumonia? (5)
- c. What is meant by the term "nosocomial" pneumonia? (1)

QUESTION 8:

Tuberculosis (TB) is a major health problem in South Africa: [6]

- a. A patient, who has previously been diagnosed with HIV, presents with a cough, night sweats, a fever and weight loss. His current CD4 count is 125.

In addition to a tuberculin test (which is not sensitive enough for making a diagnosis of active TB), which other two special tests or investigations could you do to confirm a diagnosis of TB? What do expect to find (2 x ½)? (3)

- b. What is meant by the terms “primary” and “secondary” TB (2)? Bearing in mind this patients’ HIV status and CD4 count, which of these two types of TB is do you think he is most likely to have – please explain the reason for your answer (1). (3)

QUESTION 9:

For each of the features of inflammatory disease below, state whether it describes: [6]

1. Crohn’s disease
2. Ulcerative colitis
3. Both
4. Neither

Your answer must look like this, for example:

- a. 3
- b. 4, etc

- a. Lesions occur at any level of the gastrointestinal tract
- b. Organ systems other than the gastrointestinal tract are usually involved
- c. Affected bowel usually becomes thickened and narrowed
- d. Distribution of lesions is usually continuous
- e. Fissures and fistulas are characteristic
- f. The incidence of gastrointestinal carcinoma is increased

QUESTION 10:

A 65-year old woman is finding it hard to sleep, as her skin is too itchy. She also complains of episodes of severe pain in her upper abdomen, on the right hand side. She is in pain at the moment. You also notice that her skin and sclera are slightly yellow, confirming that she has jaundice. [12]

- a. Why would the patient be pruritic? (1)

On examination, she has tenderness in the right upper quadrant of her abdomen and a positive Murphy’s sign (tenderness localized over the gall bladder), but there are no masses. She is rather obese. You suspect that she has biliary obstruction due to gall stones.

- b. You notice that she has yellow nodules (up to 2mm in diameter) on her upper and lower eyelids, as seen in the picture on the next page. What are these nodules called? (1)



- c. What type of gallstones is she most likely to have, based on these findings? (1)
- d. If she had acute calculus cholecystitis, how would it present? (4)
- e. If it was very severe, and kept recurring, how would it be treated? (1)
- f. On questioning, she mentions that her stool is very light in color, while her urine is dark in color. Why would this be happening to her? Please explain the process that is taking place to change the color of the stool and the urine. (2)
- g. On laboratory tests, her serum alkaline phosphatase (ALP) levels are 630 UI (normal is 30-110 UI). What does an elevated ALP level tell you? (1)
- h. Which other type of condition, not related to liver or gall bladder disease, is also associated with a raised ALP level? (1)

QUESTION 11:

Nephrotic & nephritic syndromes are both presentations of kidney disease. [7]

- a. Which part of the kidney is affected in both these conditions? (1)
- b. How would you differentiate between these conditions in their most extreme and characteristic forms based on clinical features (3 x marks each)? (6)

QUESTION 12:

Define the following terms: [5]

- a. Azotaemia (2)
- b. Nephrolithiasis (1)
- c. Hydronephrosis (2)

QUESTION 13:

Bacteria can reach the kidney via ascending infections from the lower urinary tract to cause acute pyelonephritis. [6]

- Explain how incompetence of the vesico-ureteral orifice contributes to the development of this condition. (2)
- List four other predisposing conditions have been implicated in the pathogenesis of acute pyelonephritis. (4)

QUESTION 14:

A 32-year old female presents with fatigue and breathlessness. On a full blood count (FBC), she has microcytic, hypochromic red blood cells. She has a history of menorrhagia. [13]

- List 4 potential mechanisms that may lead to the development of this condition (4), and give an example of each (4). (8)
- In order to diagnose this condition, what blood test will you do in addition to an FBC? Please give the name of the blood test (1), and also list any 2 components of the test (2 x ½) and whether the values would be increased or decreased (2 x ½). (3)
- Which tests would you do if the patient's FBC came back with a raised MCV? (2)

QUESTION 15:

A 72-year old man presents with problems with urination – he has trouble starting and maintaining his urinary stream. He has a history of benign prostatic hyperplasia (BPH). In addition to his urinary symptoms, he also says that he is losing weight and just feeling generally tired and unwell. [7]

- What is your most likely diagnosis, bearing in mind his history and new complaints? (1)
- What blood test would you request to aid in the diagnosis of this condition – you may give the full name or the recognized abbreviation (1). What does this blood test indicate (1)? Why can it not be used in isolation to diagnose this condition (1)? (3)
- What other examinations and special tests / investigations can be done to confirm the diagnosis? (3)

QUESTION 16:

The long term use of high dose systemic corticosteroids may often lead to a common endocrine condition with a very characteristic presentation. [9]

- What is the name of this endocrine condition? (1)
- Which hormone causes this condition? Is this hormone elevated or decreased? (2 x ½)
- What would a patient with this condition look like? What would you be looking for on physical appearance and examination to assist your diagnosis of this condition? (6)
- What is the most common cause of this condition? (1)

QUESTION 17:

Rickets & osteomalacia: [5]

- a. What is the cause of these two disorders? (1)
- b. What characteristic signs will you look for in a child with rickets? (4)

QUESTION 18:

Congenital disorders: [3]

- a. What is the basic problem or defect in a child with osteogenesis imperfecta? (1)
- b. What is the common name (layman's term) for osteogenesis imperfecta? (1)
- c. How will a child with osteogenesis imperfect present? (1)

QUESTION 19:

Fractures are one of the most common bone pathologies: [5]

- a. What is a pathological fracture? Give an example of a possible cause. (2)
- b. What is a stress fracture (2 x marks)? Give an example of a possible cause. (3)

QUESTION 20:

A 48-year old woman, who has never had children, presents with a lump in the upper outer quadrant of her left breast. [9]

- a. Please list 2 special investigations that you can send your patient to in order to make a diagnosis of this lump. (2)
- b. How would a benign (2) and malignant (2) breast lump generally differ on physical examination? Please limit your answer to the characteristics of the lump – don't include additional findings (asked in question c). (4)
- c. Which additional findings could there be with a malignant breast lump? (3)

QUESTION 21:

How does an ectopic pregnancy present, both before (2) and after (2) rupture. Please label your answers as "before" and "after". [4]

QUESTION 22:

Blackouts can be an important indicator of neurological disease. How would you differentiate between vasovagal syncope and an epileptic attack based on precipitants / triggers, preceding auras / sensations / symptoms, events that take place during the attack and the recovery of the patient afterwards? You may answer this question in table form. [8]

QUESTION 23:

Please answer the multiple choice questions in the table at the end of the question paper.

1. A 35-year old HIV positive man complains of a “bad” taste in his mouth and discolouration of his tongue for the past 6 weeks. On examination, there is a yellow-white circumscribed plaque on the lateral aspects of his tongue. The plaque can be scraped off, to show an underlying erythematous base. Which of the following is the most likely diagnosis:
 - a. Aphthous ulcer
 - b. Cheilosis
 - c. Hairy leukoplakia
 - d. Herpetic stomatitis
 - e. Leukoplakia
 - f. Glossitis
 - g. Oral thrush

2. Which of the following are risk factors for the development of a CVA (cerebrovascular accident)?
 - a. Polycythaemia vera
 - b. Hypertension
 - c. Diabetes mellitus
 - d. Elevated blood cholesterol
 - e. All of the above
 - f. B & D

3. A 30-year old woman has had coldness and numbness in her arms and decreased vision in her right eye for the past 5 months. On physical examination, she has no fever, and her blood pressure is 100 / 70 mmHg. Radial pulses are not palpable, but her femoral pulses are strong. She has decreased sensation and cyanosis in her arms, but no warmth or swelling. Her condition remains stable for the next year. Which of the following is her most likely diagnosis?
 - a. Aortic dissection
 - b. Kawasaki disease
 - c. Microscopic polyangiitis
 - d. Takayasu arteritis
 - e. Tertiary syphilis
 - f. Thromboangiitis obliterans

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4. A 56-year old man has experienced chest pain with exertion 3 years ago, and an angiogram showed 75% occlusion of his anterior left descending artery. He was prescribed long-acting nitrates and beta-blockers, and has been asymptomatic until the past week. He now has chest pain not relieved by rest or his medications, and a presumptive diagnosis of unstable angina is made. Which of the following laboratory tests is most useful for assessing his risk for an acute myocardial infarction?
- a. C-reactive protein (CRP)
 - b. LDH
 - c. Platelet count
 - d. Factor VIII activity
 - e. Full blood count
5. A 34-year old motivational speaker has noticed that the quality of his voice has started to change over the last few months, and he is becoming progressively hoarser. On examination, he is afebrile, and there are no palpable masses in his head and neck area. He doesn't have significant sputum production, but had been advised before to give up smoking. Which of the following is most likely to produce these findings?
- a. Croup
 - b. Epiglottitis
 - c. Laryngeal polyps
 - d. Acute pneumonia
 - e. Chronic bronchitis
 - f. Emphysema
6. A 61-year old man had a myocardial infarction (MI) 1 year ago. It was his first major illness. He now wants to prevent another MI – he starts an exercise program and changes his diet. A reduction in the level of which of the following serum laboratory findings 1 year later would be the best indicator of the success of his diet and exercise regimen in preventing another MI?
- a. Cholesterol
 - b. Glucose
 - c. Potassium
 - d. Renin
 - e. Calcium

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7. A study of patients recently diagnosed with type 2 diabetes mellitus follows them for 20 years to determine the prevalence and severity of complications of this disease. Which laboratory test is most likely to be the best way of monitoring disease and glucose control in these patients?
- Random plasma glucose
 - Fasting plasma glucose
 - Glycosylated haemoglobin
 - Glycosylated serum albumin
 - Microalbuminuria
 - Oral glucose tolerance test
8. A 17-year old girl notices a small, sensitive, gray-white area forming on the lateral border of her tongue, 2 days before the end of her year-end examinations. On examination, she is afebrile. There is a shallow, ulcerated, 0.3 cm lesion with an erythematous rim. No specific therapy is given, and the lesion disappears after 2 weeks. She does not smoke or chew tobacco. What is the most likely diagnosis of the lesion?
- Aphthous ulcer
 - Oral thrush
 - Herpes simplex stomatitis
 - Leukoplakia
 - Sialadenitis
9. A 25-year old healthy man suddenly develops severe pain in his scrotum. The pain continues for 6 hours, and he goes to his hospital emergency room. On examination, he is afebrile. There is severe tenderness, slight enlargement and engorgement of his right testicle, but no other findings. Which of the following is most likely to have caused these findings?
- Local invasion by a testicular tumour
 - Parasitic invasion of the scrotum
 - An infection with *Treponema pallidum*
 - Obstruction of blood flow
 - Obstruction of lymph flow
 - Dissemination of TB from the lungs to the testis
10. A 39-year old woman sees her physician because she has had abdominal pain and intermittent diarrhoea for the past 3 months. A stool sample is positive for occult blood. She is afebrile. A colonoscopy is performed, and biopsy specimens are consistent with Crohn's disease. She doesn't respond to medical therapy, and a part of her colon and terminal ileum are surgically removed. Several weeks later, she appears healthy but complains of easy fatigability. On investigation, FBC finding show haemoglobin of 10.6 g/dL (normal 12.5 – 16.0), RBC count 2.69 million / μ L (normal 4.2 – 5.4 million), MCV 118 μ m (normal 78 – 100), platelet count 378 000 / mm³ (normal 150 000 – 350 000), and WBC count 9.8 / mm³ (normal 4.0 – 10.5). Which of the following is most likely to produce these findings?

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- a. Haemolytic anaemia
 - b. Aplastic anaemia
 - c. Chronic blood loss
 - d. Vitamin B12 deficiency
 - e. Anaemia of chronic disease
 - f. Bone marrow metastases
11. A 5-year old boy has a history of recurrent urinary tract infections. Physical examination shows an abnormal constricted opening of the urethra on the ventral aspect of the penis, about 1.5 cm from the glans of the penis. There is also a cryptorchid testis on the left, and an inguinal hernia on the right. Which term best describes his penile abnormality?
- a. Hypospadias
 - b. Phimosis
 - c. Balanitis
 - d. Epispadias
 - e. Paraphimosis
 - f. Bowen disease
12. A 19-year old woman has had pelvic pain and an unusual vaginal discharge for 1 week. A pelvic examination shows mild erythema of the ectocervix. A Pap smear shows many neutrophils but no dysplastic cells. A cervical culture grows *Neisseria gonorrhea*. If this infection is not treated appropriately, the patient will be at an increased risk for which of the following conditions?
- a. Ectopic pregnancy
 - b. Dysfunctional uterine bleeding
 - c. Cervical carcinoma
 - d. Endometrial hyperplasia
 - e. Endometriosis
 - f. Placenta previa
13. A 25-year old woman in her 9th month of pregnancy has increasing pain on defecation and notices bright red blood on the toilet paper. She has had no previous gastrointestinal problems. She gives birth, and the rectal pain subsides, and there is no more bleeding. Which of the following is the most likely cause of these findings?
- a. Angiodysplasia
 - b. Ischaemic colitis
 - c. Placenta previa
 - d. Intussusception
 - e. Haemorrhoids
 - f. Volvulus
 - g. Ectopic pregnancy

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14. A 10-year old girl develops subcutaneous nodules over the skin of her arms and torso. She has choreiform movements and starts to complain about pain in her knees and hips, particularly with movement. A friction rub is heard on auscultation of her chest. Which of the following is usually found in these patients on history?
- a. Diabetes mellitus
 - b. Kidney failure
 - c. Peripheral oedema
 - d. Acute streptococcal pharyngitis 2-3 weeks before onset of these symptoms
 - e. Liver cirrhosis
 - f. Ventricular septal defect
15. A 2-year old child is brought to his physician because of failure to thrive. Physical examination shows that the child is short, and has coarse facial features, a protruding tongue, and an umbilical hernia. Profound mental retardation becomes apparent as the child matures. A deficiency of which of the following hormones is most likely to explain these findings?
- a. Cortisol
 - b. Norepinephrine
 - c. Somatostatin
 - d. Thyroxine (T4)
 - e. Insulin
16. A 25-year old woman has noticed a breast secretion for the past month. She is not breastfeeding, and has never been pregnant. She has not menstruated for the past 5 months. Physical examination yields no abnormal findings. MR imaging of the brain shows a 0.7 cm mass in the pituitary gland. Which of the following additional complaints is most likely to be present in this patient?
- a. Hyperthyroidism
 - b. Acromegaly
 - c. Infertility
 - d. Cushing disease
 - e. Syndrome of inappropriate antidiuretic hormone
17. A 42-year old retired prostitute who became sexually active at age 12 is at risk to develop:
- a. Endometriosis
 - b. Cervical carcinoma
 - c. Breast cancer
 - d. Uterine carcinoma
 - e. Uterine leiomyomas

18. Endometriosis:

- a. Has ectopic endometrium that responds to hormonal fluctuations in the menstrual cycle
- b. Occurs predominantly in the pleural cavity
- c. Causes infertility in all women who have this condition
- d. Does not recur after treatment
- e. A & D are correct
- f. All the above are correct

19. A female patient complains of a thick, white vaginal discharge and a bit of itching. You suspect the cause is:

- a. *Neisseria gonorrhea*
- b. *Treponema pallidum*
- c. *Candida albicans*
- d. *Trichomonas vaginalis*
- e. Herpes simplex type 2

20. A 49-year old man has used chewing tobacco and snuff for many years. During a visit to the dentist, a whitish lesion is seen on the side of his tongue palate. It cannot be removed by scraping. Biopsy of the lesion shows a thickened squamous mucosa. Several years later, a biopsy of a similar lesion shows carcinoma in situ. Which of the following is the most likely diagnosis?

- a. Aphthous ulcer
- b. Oral candidiasis (thrush)
- c. Lichen planus
- d. Leukoplakia
- e. Pyogenic granulomas
- f. Xerostomia

MCQ answer table:

Please make sure your answers are clear and unmistakable.

Writing in CAPITAL LETTERS is usually better than lower case letters.

1		11	
2		12	
3		13	
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